TETRA TECH

August 3, 2016

Ms. Susan Fisher
On-Scene Coordinator
U.S. Environmental Protection Agency – TLC
8600 NE Underground Drive, Pillar 253
Kansas City, Missouri 64161

Subject: **Removal Action Report**
PCE Chestnut Street Site, Atlantic, Iowa
U.S. EPA Region 7 START 4, Contract No. EP-S7-13-06, Task Order No. 0126
Task Monitor: Susan Fisher, EPA Task Order Manager

Dear Ms. Fisher:

Tetra Tech, Inc. (Tetra Tech) is submitting the attached removal action report pertaining to the above-referenced site. If you have any questions or comments regarding this submittal, please contact the Project Manager at (816) 412-1788.

Sincerely,

[redacted]

[redacted]
START Project Manager

[redacted]

[redacted], PG, CHMM
START Program Manager

Enclosures

cc Debra Dorsey, START Project Officer (cover letter only)
Jeff Pritchard, EPA On-Scene Coordinator

40518415

X9025.16.0126.000

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REMOVAL ACTION REPORT
PCE CHESTNUT STREET – ATLANTIC, IOWA

Superfund Technical Assessment and Response Team (START)
Contract No. EP-S7-13-06, Task Order No. 0126

Prepared For:

U.S. Environmental Protection Agency
Region 7
11201 Renner Boulevard
Lenexa, Kansas 66219

August 3, 2016

Prepared By:

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CONTENTS

APPENDICES

TABLES

1.0 INTRODUCTION

The Tetra Tech, Inc. (Tetra Tech) Superfund Technical Assessment and Response Team (START) was tasked by the U.S. Environmental Protection Agency (EPA) Region 7 Superfund Division to document removal action activities in June 2016 at the PCE Chestnut Street site in Atlantic, Iowa. The removal action involved installation of indoor vapor mitigation systems at two buildings—one commercial building in the downtown business district of Atlantic, and one residence just west of downtown. The systems were installed to limit intrusion of subsurface tetrachloroethene (PCE) vapors into the buildings (through cracks in concrete basement floors or building slabs, or through dirt floors) that could present inhalation threats to workers, customers, residents, and visitors. PCE has been detected in groundwater, soil, soil gas, and/or indoor air at several locations in Atlantic, particularly along Chestnut Street. Sources of most of this PCE are suspected to have been former dry cleaning facilities (at multiple locations).

2.0 SITE LOCATION/DESCRIPTION

Atlantic is a rural community in the northeastern portion of Cass County, Iowa, about 75 miles west of Des Moines, Iowa, and 45 miles northeast of Council Bluffs, Iowa (see Appendix A, Figure 1). The approximate population of Atlantic in 2016 was 7,082 (IA HomeTownLocator 2016). During this removal action, two separate vapor mitigation systems were installed in the basement of a commercial building. The building housed storefronts with the following three addresses along Chestnut Street:

- 310 Chestnut Street – Occupied by office for Channel 18 & Digital 121-2, Atlantic Community Access Network (C.A.N.)
- 312 Chestnut Street – Occupied by Dance Atlantic, a dance studio
- 314 Chestnut Street – Currently vacant

The basement of this commercial building encompassed approximately 50 by 100 feet, and was divided by a wall with a small walkway at the west end, allowing access between the north and south sides. For this removal action, one vapor mitigation system was installed in each side of the basement. In the remainder of this report, the address of this commercial building will be referred to as 312 Chestnut Street. A vapor mitigation system was also installed in the basement of an occupied residence at 214 Locust Street. The basement at this residence encompassed approximately 18 by 30 feet.

3.0 BACKGROUND

The PCE Chestnut Street site was discovered during vapor intrusion sampling at the adjacent PCE Former Dry Cleaners site in March 2015. During that sampling event, Tetra Tech collected sub-slab soil gas and indoor air samples at residences and commercial buildings primarily downgradient of the suspected contaminant source at the PCE Former Dry Cleaners site (the former Norge Dry Cleaning Village [at 1205 East 7th Street]).

Included in the sampling event were commercial buildings at 315 and 319 Chestnut Street, approximately 1.0 mile west-northwest of the former Norge Dry Cleaning Village. Indoor air sample results from those buildings indicated presence of PCE at concentrations above its Regional Screening Level (RSL) for industrial air of 47 micrograms per cubic meter ($\mu g/m^3$). Groundwater flow at the site is generally to the north; therefore, contamination from the former Norge Dry Cleaning Village (associated with the PCE Former Dry Cleaner site) is not suspected to influence PCE concentrations identified at commercial buildings along Chestnut Street. The 315 Chestnut Street building, currently serving as a book store/restaurant, is also the former location of a dry cleaner. A review of historical documents and interviews with locals revealed that at least five other dry cleaners formerly operated in the downtown area—at 218 Chestnut Street, 318 Chestnut Street, 500 Chestnut Street, 410 Poplar Street, and 8 East 4th Street. These former dry cleaners are potential sources of PCE (and trichloroethene [TCE], a degradation product of PCE) at the site.

EPA conducted removal assessment activities in July and October 2015, which included collection of vapor intrusion and groundwater samples. Vapor intrusion sampling occurred to delineate the extent of PCE contamination in the surrounding area. Groundwater sampling was conducted to identify source areas of the PCE contamination, and to delineate the extent of PCE contamination in groundwater. Based on results of the vapor intrusion sampling, EPA-funded removal activities were determined warranted to address elevated concentrations of PCE and/or TCE detected in indoor air and sub-slab soil gas samples that exceeded removal action levels (RAL) established for the site (see Table 1).

TABLE 1

REMOVAL ACTION LEVELS
PCE CHESTNUT STREET SITE – ATLANTIC, IOWA

Description	Removal Action Level ($\mu g/m^3$)	
	PCE	TCE
Indoor Air – Residential	42	2.0
Indoor Air – Business	180	6.0
Sub-slab Soil Gas – Residential	1,400	67
Sub-slab Soil Gas – Business	6,000	200

Notes:

PCE Tetrachloroethene
TCE Trichloroethene
$\mu g/m^3$ Micrograms per cubic meter

Seven vapor mitigation systems were installed between July 2015 and February 2016 by two different contractors, Thrasher Basements and Radon Solutions (under contract to EPA's Region 7 Emergency and Rapid Response Services [ERRS] contractor). For each installation, a 3-inch-diameter hole was drilled through the basement floor or slab, to be used as an extraction point. Each extraction point was installed as close to the center of the floor/slab as possible. Polyvinyl chloride (PVC) piping was then inserted into the extraction point, configured to exit the structure through an exterior wall, and connected to a fan assembly mounted outside the building to exhaust sub-slab vapors to ambient air. Within basements and/or crawl spaces with dirt floors, drainage mats were installed and covered by vapor barrier fabrics to reduce vapor intrusion into the basements from subsurface soil. The vapor barriers consisted of seven layers of high-density polyethylene, low-density polyethylene, and polyester cord.

Removal activities were also warranted at the former Cass County Cleaners at 500 Chestnut Street, where dry cleaning-related chemicals had been abandoned. Approximately 100 various-sized containers of chemicals associated with Cass County Cleaners required proper removal and disposal during the removal action. An inventory of those chemicals was obtained during pre-removal site visits by both EPA and ERRS in September 2015. The inventory identified hazardous wastes, including corrosive and flammable materials, and other chemicals such as PCE and TCE. On October 9, 2015, ERRS segregated and lab-packed the materials according to compatibility guidelines and disposal requirements. In addition, a PCE-containing solution that remained in a dry cleaning machine inside the building was recovered and containerized for disposal. In all, 18 containers were shipped off site for proper disposal. Those containers varied in size from 5 to 55 gallons. The containers were removed from the site on November 5, 2015, by Clean Harbors (Tetra Tech 2016).

In February and March 2016, sub-slab soil gas and/or indoor air samples collected at 312 Chestnut Street (commercial building) and 214 Locust Street (residence) contained PCE concentrations that exceeded respective RALs listed in Table 1. In February 2016, a sub-slab soil-gas sample collected at 312 Chestnut Street contained over 5,000 µg/m^3 of PCE, and in March 2016, an indoor air sample collected at 214 Locust Street contained 150 µg/m^3 of PCE. Based on those results, EPA determined that a removal action was warranted to install vapor mitigation systems at those two properties.

4.0 SITE ACTIVITIES

At about 1300 hours on June 13, 2016, START member (SM) Lynn Parman arrived on site. EPA On-Scene Coordinator (OSC) Jeff Pritchard and ERRS Response Manager John Vrenick were on site, along with personnel from Platinum Radon Solutions (Platinum) from Omaha, Nebraska. Platinum had been subcontracted by ERRS to install the vapor mitigation systems at the two buildings in Atlantic for this removal action. Photographs taken by START during the site activities are in Appendix B. A summary of the removal activities follows:

4.1 312 CHESTNUT STREET

On June 13, 2016, Platinum started work at the 312 Chestnut Street location, where two separate systems were installed—one in the north half of the basement (dirt floor), and one in the south half (concrete floor). Schedule 40 PVC piping (3-inch diameter) was used for the mitigation systems.

For the north system, Platinum placed a 12-mil, polyester-enforced, polyethylene vapor barrier membrane over Mar-flex high-density, dimpled, polyethylene matting that had been placed on the ground surface. The membrane was extended up the basement walls about 3 feet above ground surface in all areas, and was secured to the walls with nails and caulk. The membrane was also taped to the base of ceiling supports in the basement. Four vertical PVC extraction pipes were connected to a horizontal PVC pipe hung below the floor joists for the ground floor of the building. The bottoms of the vertical pipes were inserted into holes cut into the membrane and then sealed with tape. The horizontal PVC piping was extended to the northeast corner of the building, where it was directed up through the ground floor and into the upper portion of a closet along the east wall. The piping was then turned to the north—into the overhead area of a former small bathroom—and then back to the east through the exterior building wall.

For the south system, five 4-inch-diameter holes were drilled through the concrete floor for vertical PVC extraction pipes. Approximately 1 cubic foot of soil was removed from each hole. The five vertical extraction pipes were attached to overhead horizontal PVC piping and inserted into the holes that had been drilled in the floor. Flexible backer rod and polyurethane caulk were used to seal the bottom of each vertical pipe into the cored hole. Diagrams of both systems are shown on Figure 2 in Appendix A.

For each system, a fan (AMG Eagle, manufactured by Festa Manufacturing Enterprises LLC; 160 watts, 1.37 maximum amps, fan speed: 3,150 revolutions per minute) was mounted to the east side of the building, along with PVC exhaust piping that extended above the fan. On June 14, 2016, Platinum completed installation of electrical conduit and wiring for both systems. Upon completion, START

confirmed effective operation of both systems via observation of slack tube manometers that had been attached to vertical PVC extraction pipes for each system (indicating vacuum was being drawn on the systems).

During installation of the vapor mitigation systems, miscellaneous containers of solvents/cleaners, hydraulic oil, etc., were observed on the ground floor of the south portion of the building (see Appendix B); several of the containers were empty. The containers included 12 55-gallon drums, 1 15-gallon drum, and 20-25 5-gallon buckets. Label information on the containers did not indicate that the materials contained PCE or TCE. Also, approximately 70 used/junk lead-acid batteries were observed.

4.2 214 LOCUST STREET

On June 14, 2016, Platinum installed a vapor mitigation system at the residence at 214 Locust Street. Two extraction points were drilled into the concrete floor of the unfinished basement for this system, which was installed in the same manner as described for the systems at 312 Chestnut Street. Exhaust piping was routed through a crawl space under the north portion of the house, and a fan for the system (same make and model as those installed at the commercial building at 312 Chestnut Street) was mounted on the north side of the house. A diagram of the system installed at 214 Locust Street is shown on Figure 2 in Appendix A.

5.0 SUMMARY

On June 13-14, 2016, START documented installation of two vapor mitigation systems in the basement of one commercial building (312 Chestnut Street), and one system in the basement of a residence (214 Locust Street), at the PCE Chestnut Street site in Atlantic, Iowa. The systems were installed because previous sub-slab soil gas and/or indoor air samples at those locations had indicated presence of an inhalation threat to workers, customers, residents, and/or visitors at those buildings, due to vapor intrusion (or potential intrusion) of PCE. This chlorinated contaminant was suspected to be associated with historical releases of solvents used by former dry cleaning facilities in Atlantic. Each vapor mitigation system consisted of PVC piping and a fan to exhaust sub-slab vapors, or vapors trapped beneath a barrier membrane, to ambient air outside the buildings.

Table 2 below lists addresses of buildings associated with the PCE Chestnut Street site where vapor mitigation systems have been installed by EPA in 2015-2016 (see Figure 3 in Appendix A).

TABLE 2

VAPOR MITIGATION SYSTEM INSTALLATIONS
PCE CHESTNUT STREET SITE – ATLANTIC, IOWA

Installation Address	Installation Contractor
Systems previously installed by EPA	
315 Chestnut Street	Thrasher Basements
317 Chestnut Street	
319 Chestnut Street	
318 Chestnut Street	Radon Solutions
321 Chestnut Street	
327 Chestnut Street	
420 Chestnut Street	
Systems installed by EPA in June 2016	
312 Chestnut Street	Platinum Radon Solutions
214 Locust Street	Platinum Radon Solutions

Note:

No mitigation system has been installed at 506 Chestnut Street, contrary to information included in previous reports (Tetra Tech 2016).

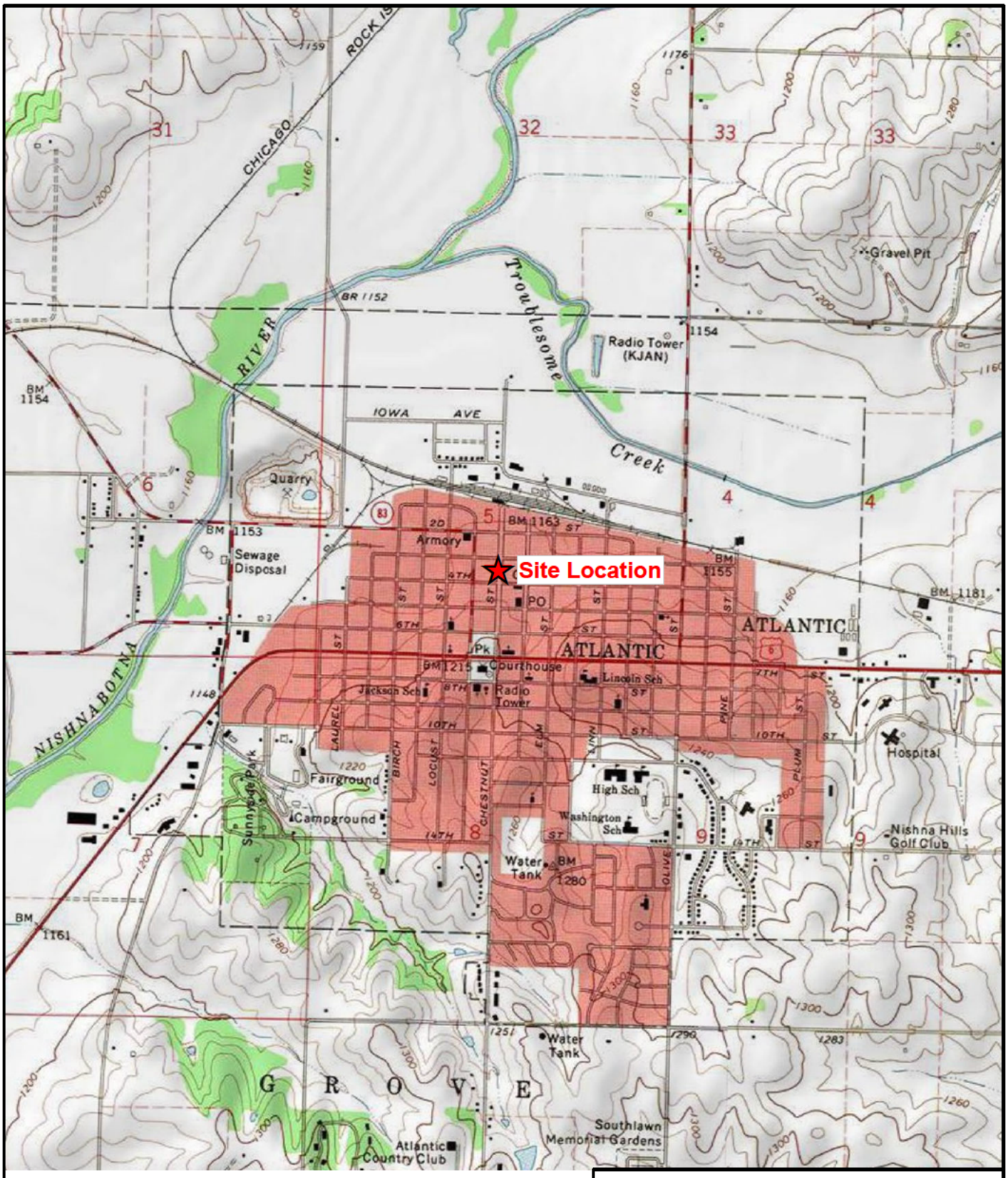
6.0 REFERENCES

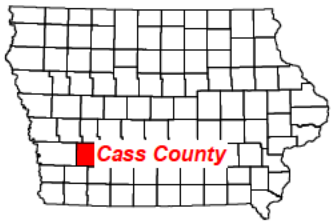
IA HomeTownLocator. 2016. Atlantic, IA Profile: Facts, Map, & Data. Accessed on July 26, 2016. http://iowa.hometownlocator.com/ia/cass/atlantic.cfm

Tetra Tech, Inc. (Tetra Tech). 2016. Removal Action Report. PCE Chestnut Street Site, Atlantic, Iowa. February 25.

APPENDIX A

FIGURES





N

0 1,000 2,000

Feet

Source: USGS Atlantic, Iowa 7.5 Minute Topo Quad, 1991
USGS Wiota, Iowa 7.5 Minute Topo Quad, 1971

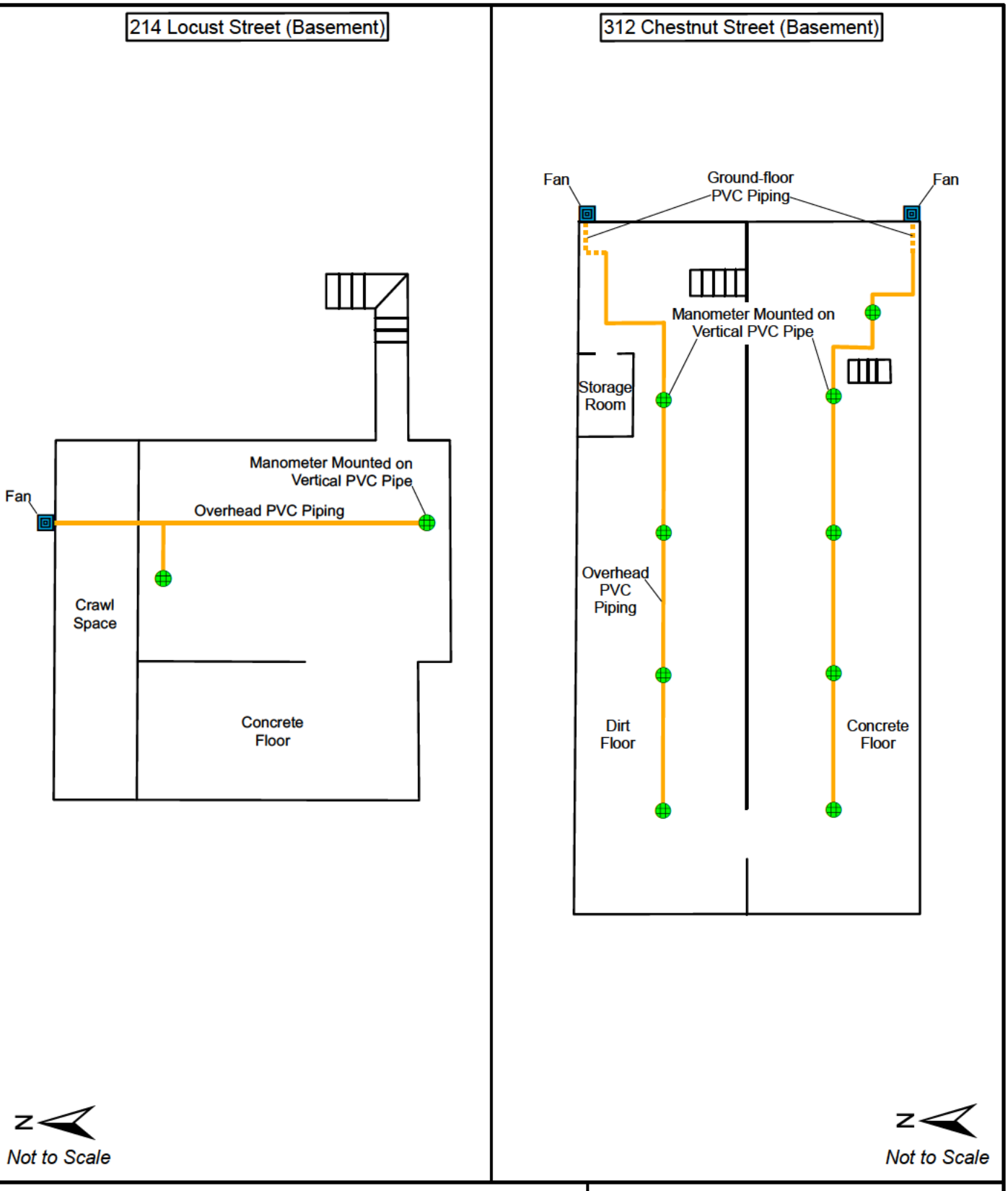
PCE Chestnut Street Site
Atlantic, Iowa

Figure 1
Site Location Map

TETRA TECH

Date 2/18/2016 Drawn By [redacted] Project No X9025.16.0126.000

X:\G\60250126\6000\Projects\mxd\Figure1.mxd



Legend

- Extraction point and vertical PVC pipe
- Fan
- Ground-floor PVC piping
- PVC piping

PVC Polyvinyl chloride

PCE Chestnut Street Site
Atlantic, Iowa

Figure 2
Diagrams of Vapor Mitigation Systems

TETRA TECH

Date 7/29/2016 Drawn By [redacted] Project No X9025.16.0126.000

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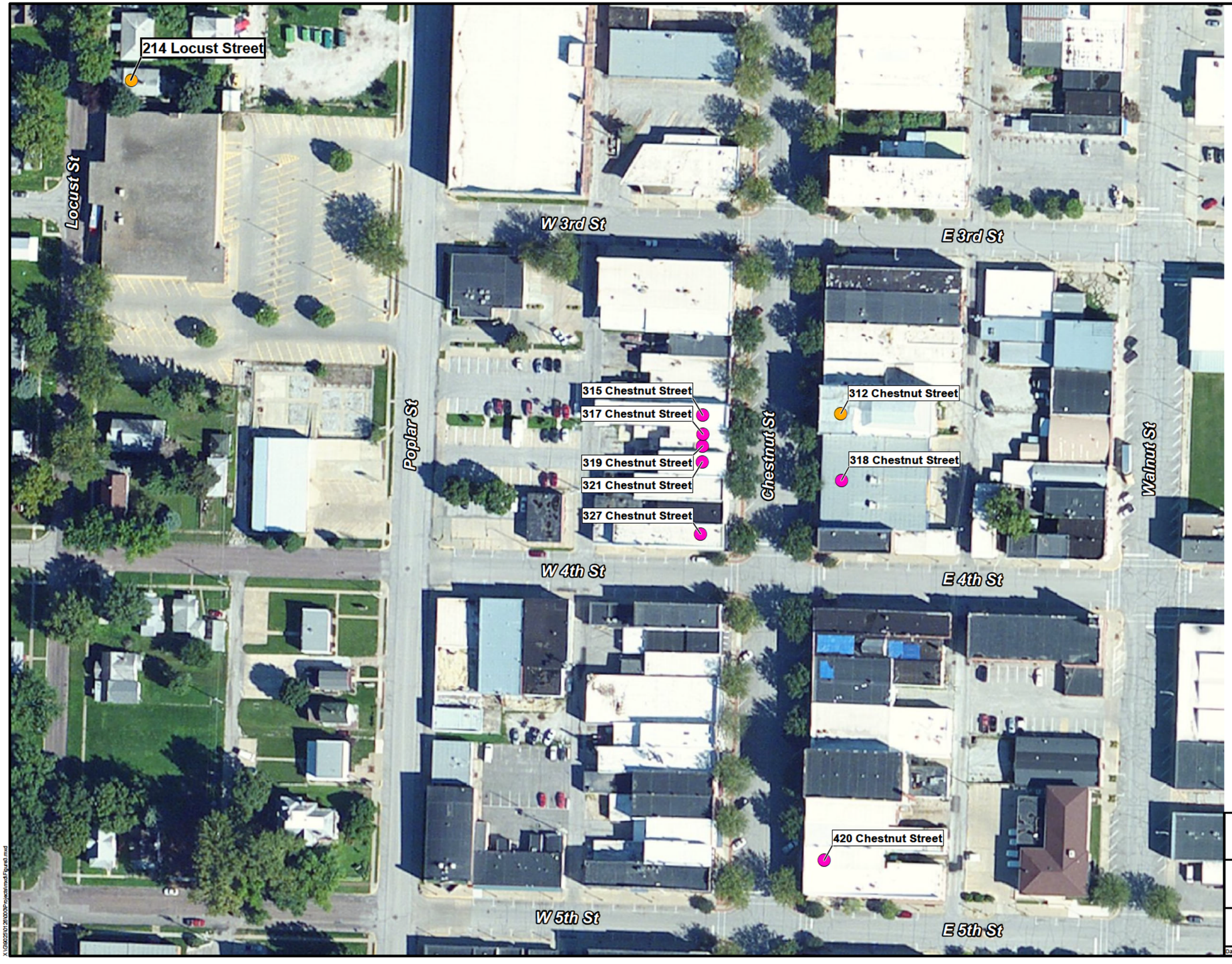


Legend

- Vapor mitigation system installed between July 2015 and February 2016
- Vapor mitigation system installed in June 2016

N

0 50 100

Feet

Source: ESRI, ArcGIS Online, World Imagery, 2011

PCE Chestnut Street Site
Atlantic, Iowa

Figure 3
Vapor Mitigation System Locations

TETRA TECH

Date 7/26/2016 Drawn By [redacted] Project No X9025.16.0126.000

X:\GIS\2015\12610\Projects\mxd\Figure3.mxd

APPENDIX B

PHOTOGRAPHIC DOCUMENTATION

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows storefronts of the commercial building at 312 Chestnut Street where two mitigation systems were installed in the basement.	1
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	6/14/16

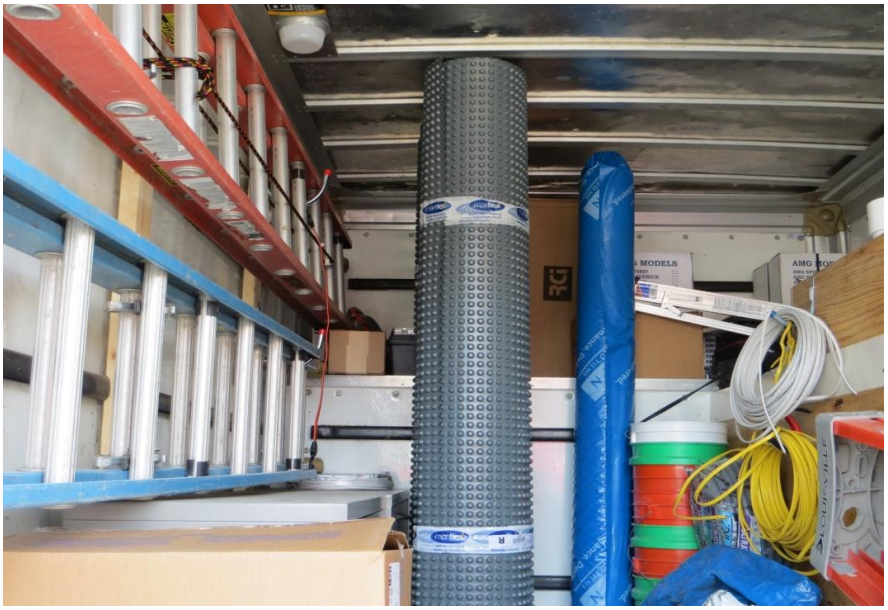
TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows a walkway between the north and south portions of the basement at 312 Chestnut Street.	2
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: South	PHOTOGRAPHER	[redacted]	6/13/16

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows the vapor barrier membrane and polyvinyl chloride (PVC) piping for the mitigation system in the north side of the basement at 312 Chestnut Street.	3
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	6/13/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows installation of overhead PVC piping for the north mitigation system at 312 Chestnut Street.	4
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Northeast	PHOTOGRAPHER	[redacted]	6/13/16

PCE Chestnut Street - Removal
Atlantic, Iowa



TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows textured material that was placed under the vapor barrier membrane in the north half of the basement at 312 Chestnut Street (dirt floor).	5
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/13/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows a vertical PVC extraction pipe taped to the membrane covering the dirt floor at the north side of the basement at 312 Chestnut Street.	6
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/13/16

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows coring of a hole through the concrete floor at the south side of the basement at 312 Chestnut Street, where a vertical extraction pipe would be installed; a bucket is being used as a dust shroud.	7
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Northwest	PHOTOGRAPHER	[redacted]	6/13/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows a hand drill with an auger bit that was used to loosen dirt/gravel beneath holes cored through the concrete floor.	8
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/13/16

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows placement of backer rod to help seal the space between a vertical PVC extraction pipe and the cored hole.	9
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/13/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows application of caulk on top of a backer rod that had been placed around a PVC extraction pipe.	10
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/13/16

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows chemical containers in the southeast portion of the building at 312 Chestnut Street (ground floor).	11
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/14/16

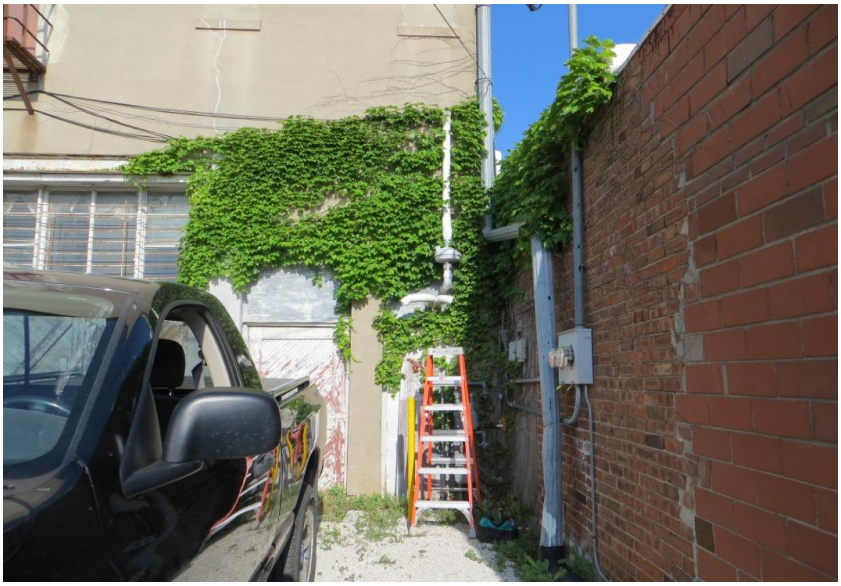
TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows a 5-gallon solvent container in the southeast portion of the building at 312 Chestnut Street (ground floor).	12
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: NA	PHOTOGRAPHER	[redacted]	6/14/16

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows PVC exhaust piping for the south system at 312 Chestnut Street, exiting the east side of the building on the ground floor.	13
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Southeast	PHOTOGRAPHER	[redacted]	6/14/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows the fan and PVC exhaust piping for the south system mounted outside the east wall of the 312 Chestnut Street building.	14
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Southwest	PHOTOGRAPHER	[redacted]	6/14/16

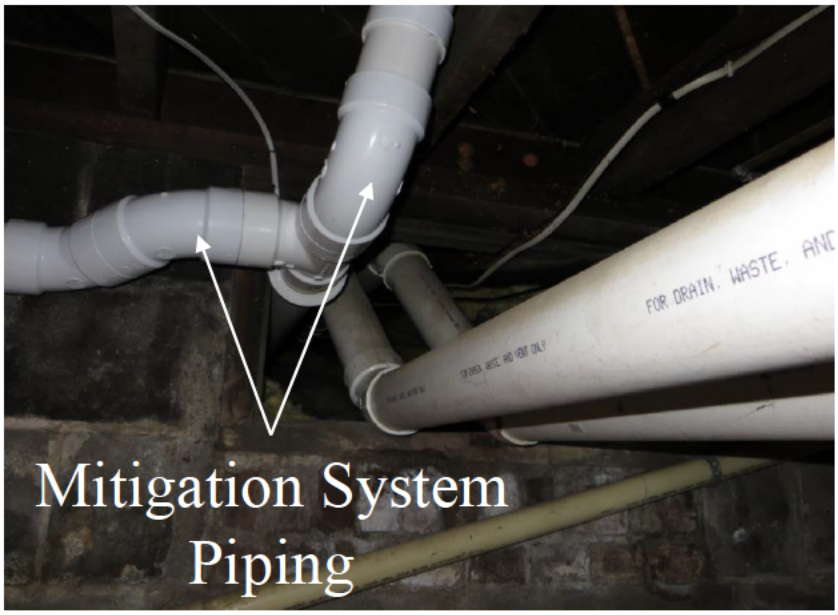
PCE Chestnut Street – Removal
Atlantic, Iowa



TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows the fan and PVC exhaust piping for the north system mounted outside the east wall of the 312 Chestnut Street building.	15
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: West	PHOTOGRAPHER	[redacted]	6/14/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows the residence at 214 Locust Street where a vapor mitigation system was installed.	16
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: East	PHOTOGRAPHER	[redacted]	6/14/16

PCE Chestnut Street - Removal
Atlantic, Iowa



TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows overhead PVC piping (with T-fitting) in the basement of a residence at 214 Locust Street.	17
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: North	PHOTOGRAPHER	[redacted]	6/14/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows PVC piping at one (north) extraction location in the basement at 214 Locust Street.	18
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Northeast	PHOTOGRAPHER	[redacted]	6/14/16

PCE Chestnut Street - Removal
Atlantic, Iowa

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows the mitigation system fan installed on the north side of the residence at 214 Locust Street.	19
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Southeast	PHOTOGRAPHER	[redacted]	6/14/16

TETRA TECH PROJECT NO. X9025.16.0126.000	PHOTO DESCRIPTION	This photograph shows a monometer mounted on a vertical PVC extraction pipe (before fan was operating).	20
	CLIENT	U.S. Environmental Protection Agency Region 7	Date
Direction: Southeast	PHOTOGRAPHER	[redacted]	6/14/16